

Claims

What is claimed is:

1. A method of informing a requesting device of configuration changes in a switched I/O network in communication with said requesting device, said method comprising the steps of:

initializing a switch in communication with said requesting device, said switch including a plurality of communication ports, said initializing including the steps of setting an initial change index value, creating an initial data vector identifying implemented ports, and storing said change index value in association with said initial data vector;

incrementing said change index in response to a subsequent configuration change;

creating a data vector in response to said subsequent configuration change, said data vector identifying each of said plurality of ports affected by said subsequent configuration change;

storing said data vector in association with said incremented change index;

responding to a query from said requesting device, by identifying to said requesting device all ports previously identified as affected by a configuration change in one or more data vectors associated with change index values more recent than the most recent change index value known to said requesting device.

2. The method of claim 1, wherein said initializing further includes the steps of:

determining the current configuration of said plurality of ports,

storing port configuration information describing said current configuration.

3. The method of claim 2, further comprising the steps of:

communicating at least a portion of said stored port configuration information to said requesting device;

storing said communicated port configuration information in said requesting device.

4. The method of claim 2, further comprising the steps of:

updating said stored configuration information to reflect said subsequent configuration change;

storing said updated configuration information.

5. The method of claim 4, further comprising the steps of:

communicating at least a portion of said updated port configuration information to said requesting device;

storing said communicated port configuration information in said requesting device.

6. The method of claim 1, wherein a limited number of the most recent pairs of associated change indices and data vectors are stored.

7. The method of claim 6, wherein when the most recent change index known to the requesting device is no longer stored by said switch, the requesting device is informed that all of said implemented ports have been affected by a configuration change.

8. The method of claim 1, further comprising the step of passing from said requesting device to said switch, substantially concurrently with said query, the most recent change index value known to said requesting device.

9. The method of claim 8, further comprising the steps of:

storing in said switch said most recent change index value known to said requesting device, and

using said stored change index value to identify the first change index value for which port configuration changes are identified.

10. A method of informing a requesting device of configuration changes in a switched I/O network in communication with said requesting device, said method comprising the steps of:

initializing a switch in processing communication with said requesting device, said switch comprising a plurality of communication ports, said initializing including the steps of determining the current port configuration, storing port configuration information describing said current port configuration, setting an initial change index value, creating an initial data vector identifying implemented ports, and storing said change index value in association with said initial data vector; changing said port configuration;

updating said stored port configuration information to describe said changed port configuration;

storing said updated port configuration information;

incrementing said change index in response to said configuration change;

creating a data vector identifying each of said plurality of ports affected by said configuration change;

storing said data vector in association with said incremented change index;

responding to a query from said requesting device, by identifying to said requesting device all ports previously identified as affected by a configuration change in one or more data vectors associated with change index values more recent than the most recent change index value known to said requesting device.

11. The method of claim 10, further comprising the steps of:

communicating at least a portion of said stored port configuration information to said requesting device;

storing said communicated port configuration information in said requesting device.

12. The method of claim 11, further comprising the steps of:

communicating at least a portion of said updated port configuration information to said requesting device;

storing said communicated port configuration information in said requesting device.

13. The method of claim 10, wherein a limited number of the most recent pairs of associated change indices and data vectors are stored.

14. The method of claim 13, wherein when the most recent change index known to the requesting device is no longer stored, the requesting device is informed that all of said implemented ports have been affected by a configuration change.

15. The method of claim 10, further comprising the step of:

passing, from said requesting device to said switch substantially concurrently with said query, the most recent change index value known to said requesting device.

16. The method of claim 15, further comprising the steps of:

storing in said switch said most recent change index value known to said requesting device, and

using said stored change index value to identify the first change index value for which port configuration changes are identified.

17. An input / output (I/O) network switching device, said device comprising:

- a plurality of communication ports, each of said ports capable of being in communication with an external data processing device;
- a switch processor in communication with said plurality of communication ports, said switch processor further capable of being in communication with a requesting device;
- a port configuration history data structure accessible to said switch processor, said history data structure comprising associated pairs of change index values and change data vectors, each of said associated pairs relating to a port configuration change event, each of said change index values providing for said history data structure an index corresponding to said related port configuration change event, each of said change data vectors identifying specific ones of said plurality of ports affected by said related port configuration change event;
- an incrementing unit, said incrementing unit increasing by one the current value of said change index value in response to a port configuration change event;
- port configuration data accessible to said switch processor, said port configuration data being used by said switch processor to create one of said change data vectors in response to and in association with a port configuration change event, said switch processor storing said incremented change index value and said one of said change data vectors as one of said associated pairs within said port configuration history data structure;
- a configuration history summary unit, wherein in response to a query from said requesting device said configuration history summary unit produces a summary vector identifying all ports previously identified as affected by a configuration change in one or more change data vectors associated with change index values more recent than the most recent change index value known to said requesting device, said summary vector capable of being communicated to said requesting device in response to said query.

18. The device of claim 17, wherein said requesting device is a host processor.

19. The device of claim 17, wherein said requesting device is a second input / output network switching device.

20. The device of claim 17, wherein said input / output switching device is an ESCON director.

21. The device of claim 17, wherein said I/O switching device is a FICON director.

22. The device of claim 17, wherein said requesting device is a process which manages a switched storage environment.

23. The device of claim 22, wherein said requesting device is a SAN manager.

24. The device of claim 17, wherein said external data processing device is selected from the group consisting of a host processor, an I/O device controller, and another I/O network switching device.

25. At least one program storage device readable by a machine tangibly embodying at least one program of instructions executable by machine to perform a method for informing a requesting device of configuration changes in a switched I/O network in communication with said requesting device, said method comprising:

initializing a switch in communication with said requesting device, said switch including a plurality of communication ports, said initializing including the steps of setting an initial change index value, and storing said change index value in association with an initial configuration of said plurality of ports;

incrementing said change index in response to a subsequent configuration change;

creating a data vector in response to said subsequent configuration change, said data vector identifying each of said plurality of ports affected by said subsequent configuration change;

storing said data vector in association with said incremented change index;

responding to a query from said requesting device, by identifying to said requesting device all ports previously identified as affected by a configuration change in one or more data vectors associated with change index values more recent than the most recent change index value known to said requesting device.

26. The at least one program storage device of claim 25, wherein said initializing further includes the steps of:

determining the current configuration of said plurality of ports,

storing port configuration information describing said current configuration.

27. The at least one program storage device of claim 26, further comprising the steps of:

communicating at least a portion of said stored port configuration information to said requesting device;

storing said communicated port configuration information in said requesting device.

28. The at least one program storage device of claim 26, further comprising the steps of:

updating said stored configuration information to reflect said subsequent configuration change;

storing said updated configuration information.

29. The at least one program storage device of claim 28, further comprising the steps of:

communicating at least a portion of said updated port configuration information to said requesting device;

storing said communicated port configuration information in said requesting device.

30. The at least one program storage device of claim 25, wherein a limited number of the most recent pairs of associated change indices and data vectors are stored.

31. The at least one program storage device of claim 30, wherein when the most recent change index known to the requesting device is no longer stored, the requesting device is informed that all of said plurality of ports have been affected by a configuration change.

32. The at least one program storage device of claim 25, further comprising the step of passing from said requesting device to said switch, substantially concurrently with said query, the most recent change index value known to said requesting device.

33. The at least one program storage device of claim 32, further comprising the steps of:

storing in said switch said most recent change index value known to said requesting device, and

using said stored change index value to identify the first change index value for which port configuration changes are identified.

34. The at least one program storage device of claim 25, further comprising the step of informing said requesting device that said switch support the history buffer feature, prior to said responding.